

Connect SAP applications and data

Streamline integration with Red Hat Integration for SAP solutions

Many of the world's electronic business transactions touch a SAP system at some point. This affects many IT initiatives because when a company seeks to open a new digital route to market, it will likely have to integrate and connect transactions with its systems of record—which are often SAP.

Previously, SAP's core ERP solution was SAP R/3. While SAP R/3 is dated, it is still widely deployed as the enterprise resource planning (ERP) system in many enterprises. However, SAP is currently encouraging its customers to migrate away from SAP R/3 and has announced SAP R/3's end-of-life in 2027.

SAP R/3's successor is SAP S/4HANA® for on-site and cloud computing, built on SAP's in-memory database SAP HANA®.

SAP preserved the interfaces into and out of SAP S/4HANA that were available in SAP R/3-based SAP Business Suite to minimize the effort required to upgrade. Nevertheless, there are significant differences between the systems, including in administration, configuration, development, and monitoring.

In addition to the technical issues, you should consider the changes in organizational culture and structure that developing microservices for hybrid cloud can require. This potentially affects your development and DevOps teams but can have wider implications.

As a result, many of SAP's enterprise customers are deferring migration because the older SAP Business Suite continues to meet their needs and migrating is difficult. However, in view of the expected depreciation of SAP R/3, coupled with SAP's desire to help you migrate from its legacy technology to the current platform, you should be planning your migration.

[Red Hat® Integration](#) helps decouple the SAP core, extend existing landscapes, and modernize SAP and non SAP applications and development practices, all of which can help you migrate.

Migrate and modernize your ERP environment with Red Hat

Organizations that rely on SAP's ERP technology face several key challenges. First, you need to migrate from SAP Business Suite to SAP S/4HANA in time to meet the SAP-imposed 2027 deadline. In addition, legacy integration technologies are unsuitable owing to a range of issues that include incompatible, hard-to-convert formats, disparate protocols, and difficulty in enforcing security.

Another issue is the high demand for interfaces from your core business systems to externally facing or client-side systems, including websites, mobile applications, partner channels, or cloud-based services, many of which are nonSAP systems. There is also a need to support development efforts required to run in both legacy and SAP S/4HANA contexts.

In the past, when SAP landscapes were normally static, these issues were solved with Enterprise Service Bus (ESB)-centric integrations, consisting of tools to help configure complicated transformation, routing, and validation connectors and centralized monitoring. Security was handled with preconfigured security profiles and an ESB was used as the underlying platform.

This approach does not support the rapid evolution of SAP landscapes to support cloud-native microservices. An application programming interface (API)-based approach is needed because SAP S/4HANA migration requires decoupling the core and integrating legacy systems, cloud-native applications, and microservices with SAP S/4HANA using APIs. Red Hat Integration helps you migrate and modernize your ERP environment by providing the API-centric tools and technologies you need to modernize your legacy SAP landscape code and migrate to SAP S/4HANA.

Migrating your SAP landscape

Migrating your existing SAP landscapes to SAP S/4HANA provides an opportunity to modernize your landscape and refactor it, simplify ongoing maintenance and development, and keep the SAP digital core clean. This is accomplished by using SAP-supported technologies for integration like the Open Data (OData) protocol, and open APIs such as SAP Business API (BAPI) and Java(TM) Connector (JCo).

These technologies help you separate your custom code, keeping it external to SAP and decoupling your business logic from your data. Finally, your applications can be further modernized by building them on [Red Hat OpenShift®](#), an enterprise-ready Kubernetes container platform that provides a consistent application platform to manage hybrid cloud, multicloud, and edge SAP deployments.

The code migration process includes these steps to develop a modernized implementation:

- ▶ **Rebuild** to decouple the SAP digital core from custom code by using code analysis tools from SAP and third-party providers. These tools can help you determine which part of the custom codebase should be migrated, and which code is redundant and can be discarded.
- ▶ **Integrate** legacy systems, cloud-native applications, and microservices with the SAP S/4HANA digital core across different deployment environments, including hybrid cloud, using Red Hat Integration. This is accomplished by exposing the data structures and BAPIs in SAP and creating endpoints with [Red Hat Fuse](#) that are called through APIs.
- ▶ **Extend** the SAP digital core with integrations and microservices running side-by-side with the core. This is also accomplished by exposing the data structures and BAPIs in SAP and creating endpoints for them with Red Hat Fuse.
- ▶ **Manage** the increased complexity of integrating SAP implementations with cloud-native apps and data in single, hybrid, or multicloud environments using Red Hat 3scale API Management.
- ▶ **Implement** the cultural and organizational changes needed to develop software for hybrid cloud. Red Hat OpenShift can ease your adoption of DevOps methodologies, which in turn can encourage your developers to develop cloud-native applications.

Integrate with Red Hat's agile, cloud-native technology

Red Hat Integration is a comprehensive set of distributed, containerized, and API-centric integration and messaging technologies to connect applications and data across hybrid infrastructures. It includes several technologies:

- ▶ Red Hat Fuse
- ▶ Red Hat 3scale API Management
- ▶ Red Hat AMQ (includes AMQ Broker, a Java Message Service implementation and AMQ Streams implementation of Apache Kafka)

- ▶ Red Hat Runtimes
- ▶ Red Hat Change Data Capture (CDC), including Debezium
- ▶ Service Registry

Red Hat Integration helps decouple the SAP core, extend existing implementations, modernize SAP and nonSAP applications, develop practices for agility and speed, and aids migration to SAP S/4HANA and hybrid cloud. This agile technology bundle combines a cloud-native platform and toolchain to support the full spectrum of modern application development. Red Hat Integration functionality includes service composition and orchestration, application connectivity, data transformation, real-time message streaming, change data capture, and API management. In addition to its general applicability to integration, Red Hat Integration features specific components that help integrate SAP applications with less effort.

Integrate applications and data across hybrid clouds with Red Hat Fuse

With Red Hat Fuse, developers can implement connected solutions in the environment of their choice. Based on Apache Camel and Apache ActiveMQ, Red Hat Fuse is a container-based integration platform that connects disparate systems using APIs. Red Hat Fuse decouples services from the SAP core so they can be created, extended, and deployed independently and also readily adapt and scale.

Red Hat Fuse connectivity to SAP ERP Central Component (ECC) and SAP S/4HANA helps decouple the SAP core because no new code needs to be created inside SAP, which vastly simplifies future SAP upgrades. It is also suited to a wide range of connectivity use cases, from legacy systems and partner networks through Internet of Things (IoT) devices to SAP S/4HANA.

Red Hat Fuse connectivity is achieved by deploying Enterprise Integration Pattern (EIP)-based integrations across hybrid clouds using the hundreds of supported pluggable connectors that are included. These are known as components in Apache Camel. These connectors include the JCo that provides connectivity using remote function calls (RFCs) and supporting OData protocol as well as Intermediate Document (IDoc) and BAPI.

Centralize control of SAP APIs with Red Hat 3scale API Management

[Red Hat 3scale API Management](#) is a full life cycle API management platform that manages SAP APIs created with Red Hat Fuse, SAP Business Hub, or SAP Business One using the OpenAPI specification. It offers centralized control of your SAP APIs, including analytics, access control, monetization, developer workflows, and more—reducing the effort required to manage multiple SAP APIs. You can share, secure, distribute, and control APIs on an infrastructure platform built for performance, customer control, and future growth on any deployment format, whether physical or virtual, on-site or in the cloud, public or private cloud, or hybrid.

Extend integration to the outer edges of your enterprise with Red Hat AMQ

Red Hat AMQ, based on Apache ActiveMQ and Apache Kafka, is a flexible messaging platform that delivers information to support integration and connect applications and their client devices. It helps you share and stream data between legacy applications, cloud-native applications, microservices, and SAP services in real time with high throughput and low latency. In addition, it helps integrate SAP services, applications, endpoints, and devices using messaging patterns, and can be deployed on Red Hat Openshift.

Build and deploy new applications and services with Red Hat Runtimes

Red Hat Runtimes helps you streamline application development with a set of products, tools, and components for developing and maintaining cloud-native applications. It offers lightweight runtimes and frameworks for distributed cloud architectures, like microservices, that can be integrated with the SAP core using Red Hat Fuse. It includes:

- ▶ **Red Hat Runtimes launcher.** Creates application boilerplate code, helping developers focus on writing business logic.
- ▶ **Red Hat JBoss® Enterprise Application Platform (JBoss EAP).** An open source platform for highly transactional, large-scale Java applications.
- ▶ **Red Hat JBoss Web Server.** Apache web server bundled with Tomcat servlet engine.
- ▶ **Cloud-native runtimes.** An extensive runtime collection for developing Java or JavaScript applications on Red Hat OpenShift, providing portability across multiple cloud infrastructures for microservices, containers, and DevOps automation.
- ▶ **Red Hat build of Quarkus.** A Kubernetes-native Java stack for building fast, lightweight microservices and serverless applications, tightly integrated with Red Hat OpenShift.
- ▶ **Red Hat Data Grid.** An in-memory, distributed, NoSQL datastore solution.
- ▶ **Red Hat AMQ broker.** A pure Java multiprotocol message broker with fast message persistence and advanced high-availability modes.
- ▶ **Migration Toolkit for Applications (MTA).** A set of tools that support large-scale Java application modernization and migration projects across a broad range of transformations and use cases.
- ▶ **Single sign-on.** Web single sign-on and identity federation based on Security Assertion Markup Language (SAML) 2.0, OpenID Connect and Open Authorization (OAuth) 2.0 specifications.

Track your data with change data capture

Red Hat Integration includes change data capture with Debezium, built on top of Apache Kafka. It records the history of data changes in your Kafka logs for use by your application. Implemented as a distributed platform, it turns your existing databases into event streams so applications can respond immediately to row-level database changes. This makes it possible for your applications to receive events correctly and completely. Change data capture provides multiple Kafka Connect-compatible connectors that monitor specific database management systems.

Register your data structures for application-level communication with service registry

Red Hat Integration includes a service registry. It is a datastore for standard event schemas and API designs based on the Apicurio Registry open source project compatible with existing Confluent schema registry client applications. It stores data structures for application-level communication and serves as a central location where developers can register and find the schemas for specific apps. It uses the cloud-native Quarkus Java runtime for low-memory footprint and fast deployment.

You can use the service registry to decouple the structure of your data from your applications. You can also share and manage your data structures and API descriptions at runtime, or publish and share the APIs you create to connect with the SAP core. Client applications, for example, can dynamically

push or pull the latest schema updates to or from the registry at runtime without needing to redeploy. Development teams can query the registry for existing schemas required by services deployed in production and can register new schemas required for new services.

The service registry implements a contract between publisher and subscriber for streaming or synchronous traffic to improve data governance and reliability. It supports multiple payload formats for standard event schemas and API specifications. It also includes full Apache Kafka schema registry support, including integration with Kafka Connect for external systems. The service registry also includes client serializers and deserializers (SerDes) to validate Kafka and other message types at runtime.

You can manage your registry content using a representational state transfer (REST) API, Maven plug-in, or a Java client. You can also implement rules for content validation and version compatibility to govern how registry content evolves over time.

Use Cases

- ▶ **ABAP as a service.** Developers can create a REST API to connect to your BAPIs and RFCs in SAP ECC or SAP S/4HANA and manage your SAP APIs in Red Hat 3scale API Management to monitor, meter, secure, throttle, and publish them.
- ▶ **Integrate SAP and non SAP systems.** Developers can connect to SAP or nonSAP sources and create data process flows that can both process data from one data source and perform operations on another. One example would be adding an employee in SAP SuccessFactors, automatically creating a ticket in ServiceNow for new employee training, and triggering tasks for it. In this case, Red Hat Fuse integrates with customer relationship management (CRM) systems and can create combined APIs to receive data from SAP and other CRM systems.
- ▶ **Integrate serverless applications with SAP.** SAP landscapes must always be available and therefore cannot be implemented as serverless environments. At the same time, they usually rely on ancillary systems that are not limited in this way. By using Red Hat Integration Apache Camel K and Red Hat AMQ Streams, you can take advantage of serverless deployments to optimize resources and scale as needed and on demand without compromising SAP landscape requirements.
- ▶ **Centralize and monetize APIs.** Data is valuable, but it can be expensive to obtain and process. Red Hat Integration helps you manage APIs and grant access to your data from SAP and non SAP sources. Once published, these APIs can be used internally or by third parties through a monetized developer portal.

Conclusion

Red Hat Integration provides an open toolset to help extend your SAP landscapes and migrate them to SAP S/4HANA. Red Hat offers a complete, open infrastructure for all SAP workloads and an ideal foundation for hybrid cloud computing. With a focus on IT optimization, agile integration, hybrid cloud infrastructure, cloud-native app development, and automation, Red Hat Integration helps you maintain and expand your current and future SAP environments, extend your SAP landscapes, and adopt modern application development practices. This lets you accelerate your development and migration efforts and encourage innovation while keeping the SAP digital core clean.

About Red Hat

Red Hat helps customers standardize across environments, develop cloud-native applications, and integrate, automate, secure, and manage complex environments with [award-winning](#) support, training, and consulting services.

North America

1 888 REDHAT1
www.redhat.com

Europe, Middle East, and Africa

00800 7334 2835
europe@redhat.com

Asia Pacific

+65 6490 4200
apac@redhat.com

Latin America

+54 11 4329 7300
info-latam@redhat.com



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t @RedHat
in linkedin.com/company/red-hat

redhat.com
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